

QUIZ #2#

COURSE NAME: MOBILE COMMUNICATION – (EE 463)

DATE: SMESTER 1, 2016-2017

TIME: ½ HOURS

IDEAL SOLUTION

Student's name:	Pin:	Student's signature	Total marks (8)

Important Notes:

- 1- TIME ALLOWED (30 minutes)
- 2- THIS EXAMINATION PAPER HAS (3 PAGES), INCLUDING THE COVER PAGE.
- 3- TOTAL NUMBER OF QUESTION (11)
- 4- TOTAL MARKS AVAILABLE (8)
- 5- MARKS AVAILABLE FOR EACH QUESTION ARE SHOWN IN THE EXAMINATION PAPER. ALL QUESTION ARE NOT OF EQUAL VALUE
- 6- ALL ANSWERS MUST BE WRITTEN IN INK. EXCEPT WHERE THEY ARE REQUIRED. PENCILS MAY BE USED ONLY FOR DRAWING, SKETCHING OR GRAPHICAL WORK.
- 7- THIS PAPER MAY NOT BE RETAINED BY THE CANDIDATE.
- 8- CLEARLY SHOW ALL STEPS AND FINAL ANSWER MUST MAKE SENSE.
- 9- READ EACH WORD CAREFULLY.

SPECIAL INSTRUCTIONS:

- 1- CANDIDATES MAY BRING TO THE EXAMINATION: CALCULATORS AND ALL NOTES THEY DEEM NECESSARY.
- 2- ANSWER ALL QUESTIONS.
- 3- YOU CAN USE THE REVERSE SIDE OF PAPERS ALSO.
- 4- ASSUME ANY MISSING VALUES.

Question	Multiple choice questions 3	Exercise: 5
Marks		

Question:-

1. Which of the following statement is true about spread spectrum:
 - a) It uses a narrow band frequency
 - b) Spread Spectrum allocates disjoint resources (frequency or time slots depending on the access system) to each user.
 - c) Spread Spectrum signals can be picked up by simple receivers
 - d) Spread spectrum signals are hard to jam and identify

Ans: d

2. What are the main reasons for using cellular systems?
 - a) The main reasons are to support many users, low power and localization
 - b) The main reason is profit maximization for service providers
 - c) The main reasons are user localization and frequency reuse

Ans: c

3. Fading of the received radio signals in a mobile communication environment occurs because of
 - a) Direct propagation
 - b) Multipath Propagation
 - c) Bi-path Propagation
 - d) None of the above

Ans: b

4. Hidden terminals in Aloha...
 - a) Do not exist, as the scheme prevents their existence
 - b) Wait for a network signal to start transmission
 - c) Do not care about other terminals and may cause collisions

Ans: a

5. In TDMA, interference happens if
 - a) Senders transmit data at the same time
 - b) Senders do not transmit data at the same time
 - c) Senders transmit data at the same frequency

Ans: a

6. In FDMA, interference happens if
- a) Senders transmit data using non-orthogonal codes
 - b) Senders transmit data at the same frequency
 - c) Senders transmit data at the same time

Ans: b

Exercise:

- A.** Each frame in GSM supports 8 time slots. Each time slot transmits 156.25 bits, and data is transmitted at 270.833 Kbits in a channel, determine
1. Time duration of a bit
 2. time duration of a slot
 3. time duration of a frame
 4. how long a user must wait between two transmissions, assuming the user is using one-time slot
- B.** If a normal time slot consists of 6 trailing bits, 8.25 guard bits, 26 training bits, and 2 traffic bursts of 58 bits of data, find the frame efficiency

Solution

A.

- 1.Bit duration : $T_b = 1/270.833 \text{ Kbps} = 3.692 \text{ microsecs}$
- 2.Slot duration = $156.25 * 3.692 = 0.577 \text{ milliseconds}$
- 3.Frame duration = $8 * 0.577 = 4.615 \text{ milli secs}$
- 4.A user has to wait for a duration of a frame before it gets a chance for its next transmission

B.

- 1.A time slot = $6+8.25+26+2*58 = 156.25 \text{ bits}$
- 2.A frame has $8* 156.25 = 1250 \text{ bits}$
- 3.Number of overhead bits per frame = $8 *(6+8.25+26) = 322 \text{ bits}$
- 4.Frame efficiency = $(1250 - 322)/1250 = 74.24 \%$

